Filing Date: August 30, 2001

Title: HIGHLY RELIABLE AMORPHOUS HIGH-K GATE OXIDE ZrO2

IN THE CLAIMS

Please amend the claims as follows:

1. (Previously Presented) A method of forming a gate oxide on a transistor body region, comprising:

evaporation depositing a substantially amorphous and 0.99999 pure single element metal layer directly contacting a single crystal semiconductor portion of the body region using electron beam evaporation at a temperature between 150 to 200 °C, the metal being chosen from the group IVB elements of the periodic table; and

oxidizing the metal layer to form a metal oxide layer directly contacting the body region, wherein the metal oxide layer is amorphous and has a smooth surface with a surface roughness variation of 0.6 nm.

- 2. (Original) The method of claim 1, wherein evaporation depositing the metal layer includes evaporation depositing a zirconium layer.
- 3.-5. (Canceled)
- 6. (Original) The method of claim 1, wherein oxidizing the metal layer includes oxidizing at a temperature of approximately 400 °C.
- 7. (Original) The method of claim 1, wherein oxidizing the metal layer includes oxidizing with atomic oxygen.
- 8. (Original) The method of claim 1, wherein oxidizing the metal layer includes oxidizing using a krypton (Kr)/oxygen (O₂) mixed plasma process.

9. (Previously Presented) A method of forming a gate oxide on a transistor body region, comprising:

evaporation depositing a substantially amorphous and 0.99999 pure single element metal layer directly contacting a single crystal semiconductor portion of the body region using electron beam evaporation at a temperature between 150 to 200 °C, the metal being chosen from the group IVB elements of the periodic table; and

oxidizing the metal layer using a krypton(Kr)/oxygen (O₂) mixed plasma process to form a metal oxide layer directly contacting the body region, wherein the metal oxide layer is amorphous and has a smooth surface with a surface roughness variation of 0.6 nm.

10.-62. (Canceled)